



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/774,577	02/01/2001	Akira Oosawa	Q61225	5559

7590 05/18/2007
SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
WASHINGTON, DC 20037-3213

EXAMINER

AZARIAN, SEYED H

ART UNIT	PAPER NUMBER
----------	--------------

2624

MAIL DATE	DELIVERY MODE
-----------	---------------

05/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/774,577	Applicant(s) OOSAWA, AKIRA	
	Examiner Seyed Azarian	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims rejected are 2,3,5-7,9-11,13-15,17-19,21-23,25-31,33-38,40-42,44-46,48-50,52-54,56-62 and 65-77.

RESPONSE TO AMENDMENT

1. Applicant's arguments, filed, 2/28/2007, see page 20 through 21, of remarks with respect to the rejection of claims 2, 3, 5-7, 9-11, 13-15, 17-19, 21-23, 25-31, 33-38, 40-42, 44-46, 48-50, 52-54, 56-62 and 65-77 have been Fully considered but they are moot in view of the new ground (s) of rejection is necessitated by applicant's amendment is made in view of Branson (U.S. patent 5,877,819).

2. Applicant's argues in essence, page 20, line 8, regarding claims 71, 72, 74 and 75-77, that Kano does not teach, " history data to sets of base image data as header data"

Contrary to the applicant's assertion, Kano discloses, (column 14, lines 40-46, "locations of the detected possible interval changes" (**history data**) can be indicated using notations such as arrows superimposed (recorded) "**on**" the subtraction image (processed image) or the **original image** (s) (base image(s), also other characteristics such as size, shape, or other significant features about the interval changes (history data).

Further, Kano discloses Fig. 11A, the local matching is performed and generate outputs result to memory 170, then a curve fitting calculator receives the output of memory 170 and performs the curve fitting function described above, and result stored in memory 190 which then outputs to memory 200 (recording on past inter-image), then performed the "subtraction" calculator device. The result of this process is stored in memory 220 and display for viewing and comparison to an output. Fig. 11B, as shown analyzer is connected in series between the memories, and additional memory is provided for storing the results of local matching for generation of the appropriate weighting factors (column 12, line 55 through column 13, line 18), and finally a pair of images for a particular patient where, "the earlier image was taken **two**

years earlier” (recording history), for comparison (column 13, lines 20-35).

Kano clearly discloses that notations **(history data)** can be superimposed (recorded) on the subtraction image, but does not explicitly state, “history data to sets of base image data as header data”. For this feature, or amended claim, examiner is using this reference, supplied with this action: Branson (U.S. patent 5,877,819) in the same field of medical procedure discloses a system for acquiring images and managing information that can be used with inter-image operations and manipulations (see Abstract and column 12, line 14), that uses a preference database that stores the preference information as a plurality of linked records (appended) that includes images that are combined with text, graphics (history data) that can be stored and displayed in a manner preferred by the user (column 2, lines 15 – 64). Also, Branson discloses that by using the preference database a user can arrange data as file header data that contains text, graphics, manipulation functions (history data) (See Figs. 6 and 7, Column 14, lines 8-15), if an image is saved, a tag (marker) is placed in the image file header by the preference database.

Therefore it would have been obvious to one skilled in the art at the time the invention was made to modify Kano’s system of inter-image operations that consist of subtraction images that contain history data such as name of patient, identification number with the teachings of Branson so that history data is applied in user preference database as header data.

Furthermore, in response to applicant’s argument, page 20, line 18, regarding claims 70 and 73, that Kano does not teach, “attaching history data to sets of base image data, where the history data is subtraction processing history data”. The Examiner disagrees and indicates, Kano discloses (column 14, lines 17-46, the subtraction images can be viewed by the radiologist as a final data output, which displayed along with the original images for comparison purposes of the

Art Unit: 2624

original images with subtraction images can be displayed either as softcopy such as video displays or as hardcopy, to detect or identify interval changes, which can thus provide information to radiologists).

Also, Kano discloses (column 2, lines 29-49, "providing changes between a pair of temporally sequential medical images (base images) and detecting abnormal regions where the **two images are matched** with each other)

Further Examiner indicates, (column 13, lines 21-46, Fig. 15A, 15B and 16A, 16B, pair of same images for a particular patient where the earlier image was taken two years earlier, and difference image (**subtraction**) is shown, which the existence of various artifacts in this figure is prominent due to the mismatch of the anatomical features, also Fig. 16A shows the difference in amount of cardiomegaly, same image (identical), taken two years earlier (recording history), also (column 2, lines 29-49, providing changes between a pair of temporally sequential medical images and detecting abnormal regions where the two images are matched with each other).

Claim Rejections - 35 USC § 103

3. Following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2624

4. Claims 2, 3, 5-7, 9-11, 13-15, 17-19, 21-23, 25-31, 33-34, 36-38, 40-42, 44-46, 48-50, 52-54, 56-62 and 65-75, are rejected under 35 U.S.C. 103(a) as being anticipated over Kano et al (U.S. patent 5,359,513) in view of Branson (U.S. patent 5,877,819).

Regarding claim 70, Kano discloses an inter-image operation method comprising the steps of, carrying out an inter-image operation between two or more sets of base image data each representing a distinct base image of an identical object to obtain processed image data therefrom, (column 2, lines 29-49, providing changes between a pair of temporally sequential medical images and detecting abnormal regions where the two images are matched with each other, also Fig. 11A, column 12, lines 44-67, as shown digital image input device supplies the same digitized image to each of image memories 110 and 120, each of these memories has a first output has a first output which is received by ROI image memory and shift-map generator, local matching is performed (processed image data));

recording history data on past inter-image operations (column 14, lines 40-46, “**locations (angles) of the detected possible interval changes**” (history data) can be indicated using notations such as arrows superimposed (recorded) “**on**” the subtraction image (processed image) or the **original image** (s) (base image(s), also other characteristics such as size, shape, or other significant features about the interval changes (history data), also Fig. 11A, column 12, line 55 through column 13, line 18, 11A, the local matching is performed and generate outputs result to memory 170, then a curve fitting calculator receives the output of memory 170 and performs the curve fitting function described above, and result stored in memory 190 which then outputs to memory 200 (recording on past inter-image), then performed the subtraction calculator device. The result of this process is stored in memory 220 and display for viewing and comparison to an

Art Unit: 2624

output. Fig. 11B, as shown analyzer is connected in series between the memories, and additional memory is provided for storing the results of local matching for generation of the appropriate weighting factors);

storing the two or more sets of base image data and attaching the history data to the stored two or more sets of base image data (column 4, lines 57-68, a pair of first and second images (step 10, 20), image registration and then subtraction, also column 5, lines 34-47 refer to determine and calculation of shift mapping, furthermore, column 14, lines 17-46, the subtraction images can be viewed by the radiologist as a final data output, which **displayed** along with the original images for comparison purposes of the original images with subtraction images can be **displayed** either as softcopy such as video displays or as hardcopy, to detect or identify interval changes, which can thus provide information to radiologists).

However Kano clearly discloses that notations (**history data**) can be superimposed (recorded) on the subtraction image, but does not explicitly state, "history data to sets of base image data as header data". For this feature, or amended claim, examiner is using this reference, supplied with this action: Branson (U.S. patent 5,877,819) in the same field of medical procedure discloses a system for acquiring images and managing information that can be used with inter-image operations and manipulations (see Abstract and column 12, line 14) that uses a preference database that stores the preference information as a plurality of linked records (appended) that includes images that are combined with text, graphics (history data) that can be stored and displayed in a manner preferred by the user (column 2, lines 15 – 64). Also, Branson discloses that by using the preference database a user can arrange data as file header data that contains

Art Unit: 2624

text, graphics, manipulation functions (history data) (See Figs. 6 and 7, Column 14, lines 8-15), if an image is saved, a tag (marker) is placed in the image file header by the preference database.

Therefore it would have been obvious to one skilled in the art at the time the invention was made to modify Kano's system of inter-image operations that consist of subtraction images that contain history data such as name of patient, identification number with the teachings of Branson so that history data is applied in user preference database as header data.

Regarding claim 2, Kano discloses an inter-image operation method according to claim 70, wherein the history data on the past inter-image operation are attached to the processed image (Fig. 11A, column 12, line 55 through column 13, line 18, 11A, the local matching is performed and generate outputs result to memory 170, then a curve fitting calculator receives the output of memory 170 and performs the curve fitting function described above, and result stored in memory 190 which then outputs to memory 200 (recording on past inter-image), then performed the subtraction calculator device. The result of this process is stored in memory 220 and display for viewing and comparison to an output. Fig. 11B, as shown analyzer is connected in series between the memories, and additional memory is provided for storing the results of local matching for generation of the appropriate weighting factors).

Regarding claim 3, Kano discloses an inter-image operation method according to Claim 70, wherein the history data on the past inter-image operations are attached to the processed image data obtained through the inter-image operation (column 4, lines 57-68, a pair of first and second images (step 10, 20), image registration and then subtraction).

Regarding claim 5, Kano discloses an inter-image operation method according to Claim 70, wherein the history data on the past inter-image operations include information identifying

Art Unit: 2624

the base images each represented by one of said two or more sets of the base image data used for calculating the processed image data (column 5, lines 1-22, to obtain improved image registration between the two images).

Regarding claim 9, Kano discloses an inter-image operation method according to Claim 70, wherein the history data on the past inter-image operations include such data indicating whether or not the processed image data on a certain processed image have already been obtained (column 5, lines 24-33, matching between each corresponding pair of ROIs and comparing the result and column 8, lines 59-66, best match location are selected to perform a fine –search for local matching in the second step for accuracy).

Regarding claim 13, Kano discloses an inter-image operation method according to Claim 9, wherein the history data on the past inter-image operations include information on recording sites of the processed image data obtained in the past, and wherein a desired set of the processed image data stored at the recording site thereof is fetched and outputted instead of conducting the inter-image operation to recalculate the desired set of the processed image data, if it was found by referring to the history data that the desired set of processed image data had already been obtained (column 12, lines 44-68, clearly discloses the digital image input device supplies the same digitized image to each of the image memories 110, 120 (which referred as **past image**). Each of these memories has a first output, which is received, by RIO location. Image memory 120 has a second output, which is received by subtraction calculator 210. Local **matching is performed in calculator 150**, which output the **result** to generator 160 and calculation to memory 170, where the **result**

Art Unit: 2624

stored in memory 190. A curve-fitting calculator 180 receives the output of memory 170 and performs the curve fitting function described above.

The result of this process is stored in memory and **subsequently displayed** to an output display device **for viewing by the radiologist**. It is obvious that processed image that is stored in the memory must be **retrieved (fetched)** in order to be view by the radiologist. Thus Kano does teach the claim limitation as recited in claim 13.

Regarding claim 25, Kano discloses an inter-image operation method according to claims 70, wherein the inter-image operation includes a subtraction operation on a pixel-by-pixel basis between said two or more sets of the base image data (Fig. 1, steps 10 and 20. Digital images 1 and 2 are obtained at different points in time, and column 12, lines 29-43, subtraction image can be created by subtracting the pixel values).

Regarding claim 26, Kano discloses an inter-image operation method according to claims 70, wherein each of said two or more sets of the base image data is a set of data representing an original image (Fig. 14A-14D, column 13, lines 48-55, using two temporally sequential original images).

Regarding claim 28, Kano discloses an inter-image operation method according to claims 70, wherein the base images each represented by one of said two or more sets of the base image data are taken at different points in time (column 15, lines 64-68, determining differences between first and second images during time interval).

Regarding claim 30, Kano discloses an inter-image operation method according to claims 70, wherein each of said two or more sets of the base image data represents a radiation image for

Art Unit: 2624

medical use (Fig. 14A, column 4, lines 25-26, shows a radiographic image of a patient's chest X-ray (refer to radiation image)).

Regarding claim 68, Kano discloses the apparatus of claim 67, wherein the inter-image operation means searches the database by the header information to determine whether the inter-image operation has been carried out (column 5, lines 60 through column 6, line 12).

Regarding claim 71, Kano discloses an inter-image operation method comprising the steps of: carrying out an inter-image operation between two or more sets of base image data each representing a distinct base image of an identical object to obtain processed image data therefrom (see claim 70, also, column 2, lines 29-49, providing changes between a pair of temporally sequential medical images and detecting abnormal regions where the two images are matched with each other, also Fig. 11A, column 12, lines 44-67, as shown digital image input device supplies the same digitized image to each of image memories 110 and 120, each of these memories has a first output which is received by ROI image memory and shift-map generator, local matching is performed (processed image data));

and recording history data on past inter-image operations (column 14, lines 40-46, "locations (angles) of the detected possible interval changes" (history data) can be indicated using notations such as arrows superimposed (recorded) "on" the subtraction image (processed image) or the original image (s) (base image(s), also other characteristics such as size, shape, or other significant features about the interval changes (history data);

wherein the two or more sets of base image data each represent a distinct base image of a patient and wherein the history data comprises one or more of a name of the patient; dates on which the two or more sets of base image data were obtained, an identification number or name

Art Unit: 2624

of an imaged portion of the patient (see claim 70 also Fig. 11A, column 12, line 55 through column 13, line 18, 11A, the local matching is performed and generate outputs result to memory 170, then a curve fitting calculator receives the output of memory 170 and performs the curve fitting function described above, and result stored in memory 190 which then outputs to memory 200 (recording on past inter-image), then performed the subtraction calculator device. The result of this process is stored in memory 220 and display for viewing and comparison to an output. Fig. 11B, as shown analyzer is connected in series between the memories, and additional memory is provided for storing the results of local matching for generation of the appropriate weighting factors and column 4, lines 57-68, a pair of first and second images (step 10, 20), image registration and then subtraction, also column 5, lines 34-47 refer to determine and calculation of shift mapping, furthermore, column 14, lines 17-46, the subtraction images can be viewed by the radiologist as a final data output, which displayed along with the original images for comparison purposes of the original images with subtraction images can be displayed either as softcopy such as video displays or as hardcopy, to detect or identify interval changes, which can thus provide information to radiologists);

and an angle of the imaging of the patient (column 14, lines 40-46, **“locations (angles) of the detected possible interval changes”** (history data) can be indicated using notations such as arrows superimposed (recorded) **“on”** the subtraction image (processed image) or the **original image (s)** (base image(s), also other characteristics such as size, shape, or other significant features about the interval changes (history data), also column 15, lines 18-35).

Regarding claims 6, 10, 14, 18, 22, 33, 37, 41, 45, 49 and 53, it recites similar limitation as claim 2 is similarly analyzed.

Art Unit: 2624

Regarding claims 7, 11, 15, 19, 23, 34, 38, 42, 46, 50 and 54, it recites similar limitation as claim 3 is similarly analyzed.

Regarding claims 65 and 67, it recites similar limitation as claim 4 is similarly analyzed.

Regarding claims 17, 40 and 48, it recites similar limitation as claim 9 is similarly analyzed.

Regarding claims 21, 44 and 52, it recites similar limitation as claim 13 is similarly analyzed.

Regarding claims 27, 29 and 31 it recites similar limitation as claims 25, 26, 28 and 30 and are similarly analyzed.

Regarding claims 66, 69 and 72-75 it recites similar limitation as claim 70-71 are similarly analyzed.

Regarding claim 36, it recites similar limitation as claim 5 is similarly analyzed.

Regarding claim 56, it recites similar limitation as claim 25 is similarly analyzed.

Regarding claim 57, it recites similar limitation as claim 26 is similarly analyzed.

Regarding claim 58, it recites similar limitation as claims 25 and 26 are similarly analyzed.

Regarding claim 59, it recites similar limitation as claim 28 is similarly analyzed.

Regarding claim 60, it recites similar limitation as claims 25 and 28 are similarly analyzed.

Regarding claim 61, it recites similar limitation as claim 30 is similarly analyzed.

Regarding claim 62, it recites similar limitation as claims 25 and 30 are similarly analyzed.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.

Art Unit: 2624

Status information about the PAIR system, see [http:// pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seyed Azarian
Patent Examiner
Group Art Unit 2624
May 12, 2007

Seyed azarian